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IS 9930 (2005): Zircon refractories for glass furnace applications [MTD 15: Refractories]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

काँच भट्टी के प्रयोजनों के लिए जिरकॉन की अग्निसह
सामग्रियाँ — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

ZIRCON REFRACTORIES FOR GLASS FURNACE
APPLICATIONS — SPECIFICATION

(*First Revision*)

ICS 81.080

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Refractories Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1981. In this revision, following changes have been made:

- a) Reference clause has been added,
- b) Physical properties have been modified, and
- c) Standard marking clause has been added.

This standard has been prepared to specify the requirements of zircon refractories used in the glass industry.

Zircon refractories used in glass furnaces are generally classified into two types, namely, regular and dense, depending on their bulk density. Only regular type of refractories are being manufactured in the country at present, therefore, the standard covers the requirements for this type only.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ZIRCON REFRACTORIES FOR GLASS FURNACE APPLICATIONS — SPECIFICATION

(*First Revision*)

1 SCOPE

This standard specifies the requirements for fired refractories bricks and shapes consisting mainly of zircon (ZrO_2SiO_2) for glass furnaces applications.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1528	Methods of sampling and physical tests for refractory materials
(Part 4) : 1974	Determination of cold crushing strength (<i>first revision</i>)
(Part 6) : 1974	Determination of permanent change after heating (<i>first revision</i>)
(Part 7) : 1974	Methods of sampling and criteria for conformity (<i>first revision</i>)
(Part 8) : 1974	Determination of apparent porosity (<i>first revision</i>)
(Part 10) : 1974	Determination of size of refractory bricks (<i>first revision</i>)

IS No.

Title

(Part 12) : 1974 Determination of bulk density (*first revision*)

3 CHEMICAL COMPOSITION

The material shall comply with the following requirements:

Zirconium oxide (ZrO_2), *Min* : 63 percent

Iron oxide (Fe_2O_3), *Max* : 1 percent

NOTE — Till a suitable Indian Standard is formulated for the methods of chemical analysis of zircon-based refractories, determination of the chemical constituents, as specified above shall be done as agreed to between the purchaser and the manufacturer.

4 PHYSICAL PROPERTIES

The material shall comply with the requirements specified in Table 1.

5 DIMENSIONAL TOLERANCE

5.1 Measurement shall be made in accordance with IS 1528 (Part 10).

5.1.1 Bricks

At least 95 percent of the bricks shall meet the maximum tolerance of ± 1 percent or ± 1.0 mm, whichever is greater.

5.1.2 Taper Shapes

The tapered bricks shall have maximum taper tolerance of ± 1.5 mm.

Table 1 Physical Characteristics of Zircon Refractories for Glass Furnace Application

(*Clause 4*)

Sl No.	Characteristic	Requirement	Method of Test, Ref to IS No.
(1)	(2)	(3)	(4)
i)	Apparent porosity, percent, <i>Max</i>	20.0	1528 (Part 8)
ii)	Permanent linear change after heating at 1 550°C, percent, <i>Max</i>	± 0.5	1528 (Part 6)
iii)	Bulk density, in g/cc, <i>Min</i>	3.4	1528 (Part 12)
iv)	Corrosion resistance	Values to be decided between the purchaser and the manufacturer depending upon type of glass and furnace content	—
v)	Cold crushing strength, in MPa, <i>Min</i>	50	1528 (Part 4)

6 SAMPLING

The procedure for sampling and the criteria for conformity shall be as laid down in IS 1528 (Part 7).

7 MARKING

7.1 The refractories bricks shall be clearly marked with the manufacturer's name or trade-mark and type.

7.2 BIS Certification Marking

The refractories bricks may also be marked with the

Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and Rules and Regulations made thereunder. The details of condition under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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